LOCKING ASSEMBLIES AND SHRINK DISCS IN STAINLESS STEEL

MAV

we connect emotions

Locking Assemblies ■ Shrink Discs ■ Mini Series

www.mav.it

our company

MAV is an Italian company, world renowned for its creativity and ethics. Established in 1989, MAV has been rapidly building a reputation for its professionalism, for its reliable and comprehensive service and for its wide product range. MAV is located in Altopiano della Vigolana, Northern Italy, at the foot of the Dolomites, one of the most beautiful areas of the Alps.

our mission

Just as our products connect mechanical components in motion, our purpose is to connect our partners through their goals, feelings, wishes and emotions. Together with our partners we want to raise the standard of quality, safety and environmental protection in our field.

our vision

We see the market as a huge mosaic. The single parts of this mosaic are manufacturers, suppliers and customers. All together we form a global partnership sharing common goals and seeking mutual benefits. We like to see MAV as the center of the mosaic, a strong reference for all the other parts.

Sandro Zamboni
President of MAV S.p.A.

QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001:2015

ENVIRONMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001:2015

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This catalogue contains complete information for the MAV products in stainless steel.
The following pages will help you to find the perfect solution for your application.
Should you require assistance with an application, please feel free to contact MAV technical support.
Our engineers will be pleased to provide any information you might need.

Information subject to change without prior notification.

Traditional Methods

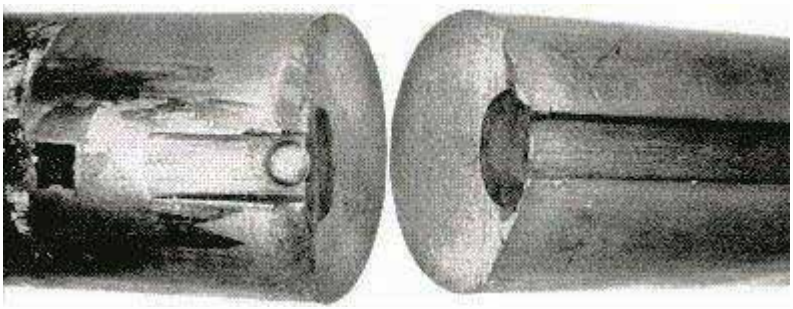

Fig. 1: failure of keyed shaft due to fatigue crack (heat treated steel C45)

Keyway and splined locking systems show important disadvantages, in particular under overload and frequent torque reversal conditions. Connected parts undergo micro movements which cause them damage. The notch of keyway seat is a stress concentrator which reduces the fatigue strength. The figures show some fatigue failures fractographs of notched shafts (courtesy of ASM International, Metals Handbook, vol 9).

Keyways and splines are eliminated by forced fit systems (pressing, heating), where high radial pressures are generated due to shaft - hub interference. A backlash free coupling is obtained. In addition, size of shafts and bearings can be reduced and, as a consequence, also cost and weight. However, forced fits show difficulties during the mounting and dismantling steps.

The MAV System

MAV Locking Devices meet both the advantages of forced fit systems and simplified installation-removal. The MAV system is based on the wedge principle: the axial load of the screws generates through the tapers a high radial force that locks the parts by friction.

Main features of MAV Locking Devices:

- shaft - locking device - hub tolerances are sufficient for easy mounting and correct positioning;
- high manufacturing precision permits close geometrical tolerances, leading to a well balanced coupling, also for high speed conditions;
- high pressures let high torque to be transmitted, also in addition with bending moment; fretting corrosion is eliminated;
- absence of notches results in enhanced static and fatigue strength, leading to lighter and more cost-effective designs;
- the large variety of standard units and the possibility of designing and manufacturing customized units allow MAV to find the best solution for any kind of requirements.

Main characteristics

Locking Assemblies

MAV series	torque capacity	hub contact pressure	self-centering	self-locking	fixed axial hub position during tightening
MAV1061 	36 - 7.110 Nm	low	yes	yes	yes
MAV1062 	36 - 7.110 Nm	low	yes	yes	no
MAV2005 	150 - 7.900 Nm	low	no	low	yes
MAV4061 	420 - 22.100 Nm	low	yes	yes	no
MAV5061 	8 - 12.600 Nm	low	yes	yes	yes
MAV6901 	290 - 15.520 Nm	low	yes	yes	no
MAV6902 	164 - 8.780 Nm	low	yes	yes	yes
MAV7903 	3 - 1.090 Nm	low	yes	low	no

Shrink Discs

MAV series	torque capacity	self-locking	
MAV2008 	310 - 34.400 Nm	no	also available in SPLIT and HALF HC & HT designs
MAV3008 	87 - 26.403 Nm	low	

Furthermore, products of other series as well as special solutions and products according to Customer's specifications in stainless steel can be offered upon request, even in small batches.

For further information or technical and commercial inquiries
please feel free to visit our website www.mav.it or contact us by phone, fax, email.
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Selection

MAV Locking Assemblies are internal locking devices, which provide a rigid, zero-backlash, frictional keyless connection between a shaft and hubs such as gears, pulleys, cams, levers, rotors and many others.

MAV Shrink Discs are external locking devices, which provide a rigid, zero-backlash, frictional keyless connection between an outer hollow shaft (hub) and an inner shaft (application example: gearboxes with hollow output shaft). Shrink Discs are installed onto outer diameter of the outer hollow shaft, which is mounted onto inner shaft.

MAV Locking Assemblies and Shrink Discs are well suited for transmitting torque, thrust loads, bending moments and radial loads, separately or in combination. They act as interference fits, but the difficulties of installation and removal of press or shrink fits are eliminated.

Performances listed in this catalogue are based on the following conditions.

- **Connected parts made of stainless steel[1].**
- **Lubrication according to MAV specifications[1].**
- **Solid shaft in Locking Assembly connections[2].**
- **Inner solid shaft in Shrink Disc connections[2].**
- **Stress in connected parts within material yield strength (elastic behavior).**

[1] Performances of locking devices may be considerably reduced, as long as connected parts are not made of stainless steel, as well as lubrication does not comply with MAV specifications.

[2] Performances of locking devices may be considerably reduced, as long as shaft (in Locking Assembly connections) or inner shaft (in Shrink Disc connections) are bored. Stress in connected parts may achieve very high values as well.

Performances of LOCKING ASSEMBLIES listed in this catalogue do not depend on grade of stainless steel they are made of.

Performances of SHRINK DISCS listed in this catalogue are reduced, as long as they are made of AISI 300 austenitic stainless steel.

Performances listed in this catalogue are rated without safety factor. The user shall take into account the specific safety factor, which depends on each application.

Selection of the suitable locking device shall be based on the following criteria, as well as other specific application requirements such as dimensional restrictions, precision of the connection, no axial displacement of hub during tightening and others (see main characteristics at pages 6 and 7).

Torque

Given the peak application torque **T**, selected unit shall meet the following requirement:
Mt › T, where **Mt** = transmissible torque.
Transmissible torque of Shrink Disc series MAV 2008 HALF HC and HT is reduced to 50% of listed values.
In case of Shrink Disc connection:

- reduction of transmissible torque applies as long as inner shaft is bored;
- change of transmissible torque applies as long as clearance between hollow shaft bore and inner shaft is different from listed values.

Combined loads

Given the following application loads:
T = peak torque
B = peak bending moment
F = peak thrust load

Resulting combined torque **Mtc** shall be calculated according to the following formula:

$$Mtc = \sqrt{T^2 + \left(F \cdot \frac{d}{2}\right)^2 + (2 \cdot B)^2}$$

where **d** = shaft diameter

Selected unit shall meet both of the following requirements:
Mt › Mtc
Mb › B, where **Mb** = transmissible bending moment

Mb depends on each application. Consult our Technical Dept. for specific information.

Transmissible loads of Shrink Disc series MAV 2008 HALF HC and HT are reduced to 50% of listed values.
In case of Shrink Disc connection:

- reduction of transmissible loads applies as long as inner shaft is bored;
- change of transmissible loads applies as long as clearance between hollow shaft bore and inner shaft is different from listed values.

Radial load

Radial loads are usually related to pin or axle connections. They apply perpendicular to centerline of shaft.

The radial load generates a contact pressure **Prad**, according to the following formula:

$$Prad = \frac{Frad}{d \cdot Ls}$$

where
d = shaft diameter
Ls = shaft – Locking Assembly contact length

Prad is added and subtracted to contact pressure **Ps** provided by Locking Assembly on the shaft.

The following requirements shall be fulfilled:
Ps + Prad ‹ $Rp_{0.2}$, where **$Rp_{0.2}$** = yield strength of shaft material
Ps - Prad › o

Multiple units connections

In applications where two or more units are installed in series, total torque capacity **Mt_{tot}** is not a linear function of the number of units **n**. It is calculated as follows:

$$Mt_{tot} = n \cdot Mt \cdot f_{RS}$$

where **f_{RS}** = reduction factor, according to table 1.

Table 1

MAV series	No. of units (n)		
	2	3	4
2005 - 1062 - 6901	0.80	0.75	0.70
4061	0.85	-	-

Verification of connected parts

The following information are intended as reference only and may be of help for the structural verification of connected parts. MAV S.p.A. disclaims any and all liability for any consequences that may result from their use.
MAV S.p.A. will not take on responsibility of design, dimensions and selection of material of connected parts.

LOCKING ASSEMBLIES
Locking assemblies exert high contact pressures on shaft (**Ps**) and in hub bore (**Ph**). Size and material of shaft and hub shall be suitable for withstanding the stress generated by the Locking Assembly, as well as by applied loads.
The following inputs take into account only the contact pressures exerted by the Locking Assembly.
Verification of connected parts is based on thick walled cylinder theory.

- Solid shaft. Material's yield strength shall be greater than contact pressure **Ps**.
- Bored shaft. The part shall be considered as a thick walled cylinder subject to external pressure = **Ps**. Material's yield strength shall be greater than resulting stress.
- Verification of hub is based on the criterion of maximum tangential stress, applied in hub bore. Minimum hub outer diameter **Dem** is calculated as follows:

$$Dem = D \cdot \sqrt{\frac{Rp_{0.2} + P_h \cdot C}{Rp_{0.2} - P_h \cdot C}}$$

where
D = Locking Assembly outer diameter (hub bore diameter)
$Rp_{0.2}$ = hub material's yield strength
C = stress reduction factor (see fig. 1)

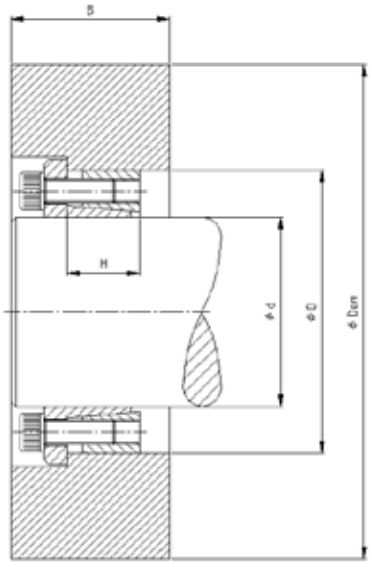


Fig. 1

Should the hub feature a different design, consider the most similar design or the worst condition. Our Technical Dept. is at your disposal for technical assistance.

Stress reduction factor C valid for all series		
B ‹ 1.5xH	1.5xH ‹ B ‹ 2xH	B › 2xH
1	0.8	0.6

SHRINK DISCS

Size and material of outer hollow shaft (hub) and inner shaft shall be suitable for withstanding the stress generated by the Shrink Disc, as well as by applied loads.

The following inputs take into account only the contact pressures exerted by the Shrink Disc.

Verification of connected parts is based on thick walled cylinder theory.

- Outer hollow shaft (hub), assuming a solid inner shaft. The part shall be considered as a thick walled cylinder subject to external pressure = **Ph** and internal pressure = **Ps**. Material's yield strength shall be greater than resulting stress.
- Solid inner shaft. Material's yield strength shall be greater than contact pressure **Ps**.
- Bored inner shaft. The part shall be considered as a thick walled cylinder subject to external pressure, which is lower than **Ps** value. Material's yield strength shall be greater than resulting stress. Consult our Technical Dept. for specific information.

Self-centering and self-locking devices

SELF-CENTERING devices provide an excellent centering of the connection. Concentricity and perpendicularity range from 0.02 mm to 0.06 mm. The self-centering characteristic depends on length, taper angle, manufacturing process and care of installation.

If the Locking Assembly is not self-centering, the hub shall feature a pre-centering section in order to achieve an excellent centering of the connection.

SELF-LOCKING devices ensure the transmission of loads even in case of loosening of the screws. The self-locking characteristic depends on taper angle and friction. Removal of self-locking devices is possible by tightening some screws into integrated push-off tapped holes.

Removal of self-releasing devices is obtained by loosening of locking screws.

Material

Martensitic stainless steel of series AISI 400 will be offered/supplied as long as inquiries/orders of MAV stainless steel standard products do not specify the requested grade of material.

Quotations/order acknoledgements of MAV stainless steel standard products do not show the grade of material.

Stainless steels of series AISI 400 feature high mechanical strength and good corrosion resistance in ordinary environments. They are magnetic.

MAV can offer products made of austenitic stainless steel of series AISI 300 (typ. 304, 304L, 316, 316L, 316Ti solution annealed) as well as austenitic-ferritic (duplex series) stainless steel (typ. W.Nr. 1.4462 / X2CrNiMoN22-5-3 EN 10088 solution annealed) upon request. Stainless steels of series AISI 300 feature moderate mechanical strength and excellent corrosion resistance in corrosive environments (typ. AISI 316 as acid-resistant material). They are non-magnetic or slightly magnetic.

Duplex stainless steels feature medium mechanical strength and excellent corrosion resistance. They are magnetic.

Screws are made of austenitic stainless steel of series AISI 300, grade A2-70 or A4-80.

Lubricants

LOCKING ASSEMBLIES

- Rings and screws of Locking Assemblies are supplied lubricated at factory with food grade oil Dow Corning Molykote® L-0532FG, class H-1, according to U.S. Food and Drug Administration.
- Shaft and hub bore shall be also oiled with same lubricant, or equivalent.
- DO NOT USE low friction lubricants, as performances would be greatly reduced.

Safety information.

Please refer to complete and updated Product and Safety Data Sheets released by Dow Corning.

Information about Molykote® L-0532FG oil:

- boiling point: › 35 °C;
- flash point: 210 °C (method: closed cup);
- can react with strong oxidizing agents;
- when heated to temperatures above 150 °C in the presence of air, product can form formaldehyde vapours, hazardous to the health.

SHRINK DISCS

- Conical surfaces and screws (threads and under-head) of Shrink Discs are supplied lubricated at factory with food grade paste Dow Corning Molykote® P-1900, class H-1, according to U.S. Food and Drug Administration. Prior to installing series MAV 2008 SPLIT and HALF HC and HT, the user shall lubricate conical surfaces and screws (threads and under-head) with above specified paste, or equivalent.
- Prior to mounting the Shrink Disc, lightly lubricate the outer diameter of outer hollow shaft.
- Prior to mounting the internal shaft into the outer hollow shaft, fitting surfaces of connected parts shall be carefully cleaned with a suitable solvent, in order to achieve lubricant-free and dry contact. This step is critical, as any lubricant on intended fitting surfaces (even if in traces) will greatly reduce the performances of the connection.

Safety information.
Please refer to complete and updated Product and Safety Data Sheets released by Dow Corning.
Information about Molykote® P-1900 paste:

- service temperature range: -30 °C to +300 °C;
- boiling point: n/a;
- flash point: › 200 °C (method: closed cup);
- can react with strong oxidizing agents;
- when heated to temperatures above 150 °C in the presence of air, product can form formaldehyde vapours, hazardous to the health.

Temperature influence

Service temperature, related solely to the locking device, depends on mechanical properties and corrosion resistance, in the specific operating environment, of stainless steel used for locking rings and screws.

Locking devices work correctly as long as temperature changes apply equally to shaft and hub.
Lubricants service temperature is a binding characteristic in the installation stage only.

CAUTION! As long as service temperature is higher than 150 °C, reactions of lubricants might be hazardous to the health and safety of the workers.

Performances listed in this catalogue apply in the following ranges of temperature in ordinary operating environment (air).

- LOCKING ASSEMBLIES and SHRINK DISCS in martensitic stainless steel series AISI 400, with screws of grade A2-70 or A4-80.
  - Lower limit: -20 °C, caused by possible embrittlement of martensitic stainless steel.
  - Upper limit: +50 °C, caused by reduction of mechanical strength of screws. Upper limit may achieve +400 °C with reduced performances.

- LOCKING ASSEMBLIES in austenitic stainless steel series AISI 300, with screws of grade A2-70 or A4-80.
  - Lower limit: -60 °C, caused by temperature admitted for A4-80 socket head cap screws (DIN 267 part 13).
  - Upper limit: +50 °C, caused by reduction of mechanical strength of screws. Upper limit may achieve +400 °C with reduced performances.

- LOCKING ASSEMBLIES in duplex austenitic-ferritic stainless steel, with screws of grade A2-70 or A4-80.
  - Lower limit: -60 °C, caused by temperature admitted for A4-80 socket head cap screws (DIN 267 part 13).
  - Upper limit: +50 °C, caused by reduction of mechanical strength of screws. Upper limit may achieve +250 °C, with reduced performances.

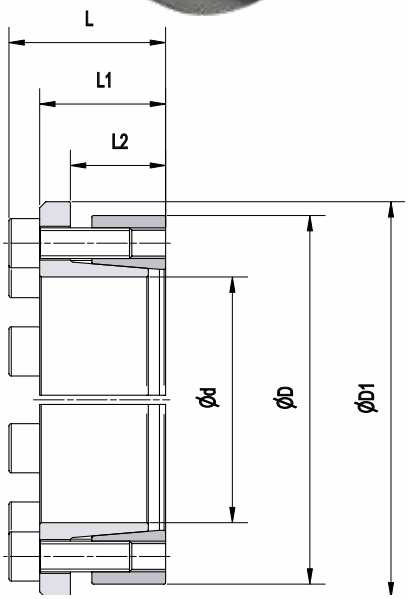
- SHRINK DISCS in duplex austenitic-ferritic stainless steel, with screws of grade A2-70.
  - Lower limit: -90 °C, caused by possible embrittlement of duplex austenitic-ferritic stainless steel.
  - Upper limit: +50 °C, caused by reduction of mechanical strength of screws. Upper limit may achieve +250 °C, with reduced performances.

Special considerations are necessary for connections working in conditions different from those ones mentioned above.

MAV 1061

Stainless steel

DIMENSIONS					SCREWS		PERFORMANCES				WEIGHT
d x D	L2	L1	L	D1	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
14 x 28	17,0	20,5	24,5	32,0	M4	3,5	36	5,1	34	17	0,07
15 x 28	17,0	20,5	24,5	32,0	M4	3,5	38	5,1	32	17	0,06
16 x 32	18,0	21,5	25,5	37,0	M4	3,5	41	5,1	30	15	0,09
18 x 47	22,5	28,5	34,5	52,0	M6	11,8	130	14,7	61	24	0,3
19 x 47	22,5	28,5	34,5	52,0	M6	11,8	140	14,7	58	24	0,3
20 x 47	22,5	28,5	34,5	52,0	M6	11,8	140	14,7	55	24	0,3
22 x 47	22,5	28,5	34,5	52,0	M6	11,8	160	14,7	50	24	0,3
24 x 50	22,5	28,5	34,5	56,5	M6	11,8	210	17,7	55	27	0,3
25 x 50	22,5	28,5	34,5	56,5	M6	11,8	220	17,7	53	27	0,3
28 x 55	22,5	28,5	34,5	61,5	M6	11,8	240	17,7	47	24	0,4
30 x 55	22,5	28,5	34,5	61,5	M6	11,8	260	17,7	44	24	0,3
32 x 60	22,5	28,5	34,5	66,5	M6	11,8	370	23,6	55	29	0,4
35 x 60	22,5	28,5	34,5	66,5	M6	11,8	410	23,6	51	29	0,4
38 x 65	22,5	28,5	34,5	71,5	M6	11,8	440	23,6	47	27	0,5
40 x 65	22,5	28,5	34,5	71,5	M6	11,8	470	23,6	44	27	0,4
42 x 75	26,5	34,5	42,5	83,5	M8	28,7	800	38,3	58	33	0,8
45 x 75	26,5	34,5	42,5	83,5	M8	28,7	860	38,3	54	33	0,7
48 x 80	26,5	34,5	42,5	88,5	M8	28,7	920	38,3	51	31	0,8
50 x 80	26,5	34,5	42,5	88,5	M8	28,7	950	38,3	49	31	0,8
55 x 85	26,5	34,5	42,5	93,5	M8	28,7	1.200	43,8	51	33	0,8
60 x 90	26,5	34,5	42,5	98,0	M8	28,7	1.310	43,8	47	31	0,9
63 x 95	26,5	34,5	42,5	102,0	M8	28,7	1.550	49,3	50	33	0,9
65 x 95	26,5	34,5	42,5	102,0	M8	28,7	1.600	49,3	48	33	0,9
70 x 110	30,5	40,5	50,5	119,0	M10	58,0	2.500	71,6	54	35	1,7
75 x 115	30,5	40,5	50,5	124,0	M10	58,0	2.680	71,6	51	33	1,8
80 x 120	30,5	40,5	50,5	129,0	M10	58,0	2.860	71,6	48	32	1,9
85 x 125	30,5	40,5	50,5	134,0	M10	58,0	3.420	80,6	50	34	2,0
90 x 130	30,5	40,5	50,5	139,0	M10	58,0	3.620	80,6	48	33	2,0
95 x 135	30,5	40,5	50,5	144,0	M10	58,0	4.250	89,5	50	35	2,1
100 x 145	33,0	45,0	57,0	154,0	M12	100,0	5.260	105,0	52	36	2,8
110 x 155	33,0	45,0	57,0	164,0	M12	100,0	5.790	105,0	47	33	3,0
120 x 165	33,0	45,0	57,0	174,0	M12	100,0	7.110	118,0	48	35	3,3



Code

- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 36 to 7.110 Nm
- Self-centering, self-locking
- Fixed axial hub position during tightening
- Single taper design
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h8; hub bore H8
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

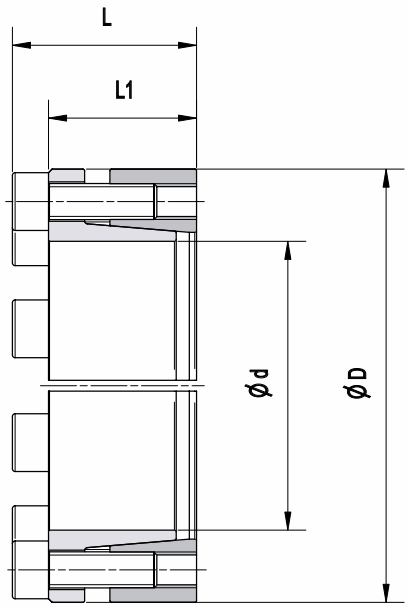
Composition

- Slotted inner ring, with integrated push-off tapped holes
- Slotted outer ring
- Set of socket head cap screws, grade A4-80

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 1062

Stainless steel



DIMENSIONS			SCREWS		PERFORMANCES				WEIGHT
d x D	L1	L	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
14 x 32	21,5	25,5	M4	2,6	36	5,1	44	19	0,09
15 x 32	21,5	25,5	M4	2,6	38	5,1	41	19	0,09
16 x 32	21,5	25,5	M4	2,6	41	5,1	38	19	0,08
18 x 47	28,5	34,5	M6	8,8	130	14,7	79	30	0,3
19 x 47	28,5	34,5	M6	8,8	140	14,7	75	30	0,3
20 x 47	28,5	34,5	M6	8,8	140	14,7	72	30	0,3
22 x 47	28,5	34,5	M6	8,8	160	14,7	65	30	0,2
24 x 50	28,5	34,5	M6	8,8	210	17,7	72	34	0,3
25 x 50	28,5	34,5	M6	8,8	220	17,7	69	34	0,3
28 x 55	28,5	34,5	M6	8,8	240	17,7	61	31	0,3
30 x 55	28,5	34,5	M6	8,8	260	17,7	57	31	0,3
32 x 60	28,5	34,5	M6	8,8	370	23,6	72	38	0,4
35 x 60	28,5	34,5	M6	8,8	410	23,6	65	38	0,3
38 x 65	28,5	34,5	M6	8,8	440	23,6	60	35	0,4
40 x 65	28,5	34,5	M6	8,8	470	23,6	57	35	0,4
42 x 75	34,5	42,5	M8	21,4	800	38,3	75	42	0,7
45 x 75	34,5	42,5	M8	21,4	860	38,3	70	42	0,6
48 x 80	34,5	42,5	M8	21,4	920	38,3	66	39	0,7
50 x 80	34,5	42,5	M8	21,4	950	38,3	63	39	0,7
55 x 85	34,5	42,5	M8	21,4	1.200	43,8	66	42	0,8
60 x 90	34,5	42,5	M8	21,4	1.310	43,8	60	40	0,8
63 x 95	34,5	42,5	M8	21,4	1.550	49,3	64	43	0,9
65 x 95	34,5	42,5	M8	21,4	1.600	49,3	62	43	0,9
70 x 110	40,5	50,5	M10	44,0	2.500	71,6	71	45	1,6
75 x 115	40,5	50,5	M10	44,0	2.680	71,6	67	43	1,6
80 x 120	40,5	50,5	M10	44,0	2.860	71,6	63	42	1,7
85 x 125	40,5	50,5	M10	44,0	3.420	80,6	66	45	1,8
90 x 130	40,5	50,5	M10	44,0	3.620	80,6	63	43	1,9
95 x 135	40,5	50,5	M10	44,0	4.250	89,5	66	46	2,0
100 x 145	45,0	57,0	M12	74,0	5.260	105,0	66	46	2,6
110 x 155	45,0	57,0	M12	74,0	5.790	105,0	60	43	2,9
120 x 165	45,0	57,0	M12	74,0	7.110	118,0	62	45	3,1

Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 36 to 7.110 Nm
- Self-centering, self-locking
- Single taper design
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h8; hub bore H8
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

Composition

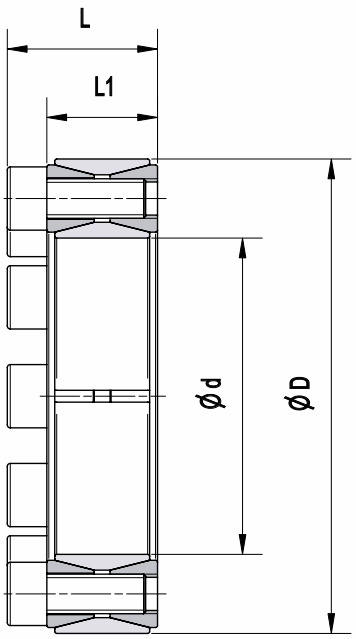
- Slotted inner ring, with integrated push-off tapped holes
- Slotted outer ring
- Set of socket head cap screws, grade A4-80

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 2005

Stainless steel

DIMENSIONS			SCREWS		PERFORMANCES				WEIGHT
d x D	L1	L	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
18 x 47	20	26	M6	8,8	150	17,0	82	31	0,2
19 x 47	20	26	M6	8,8	160	17,0	78	31	0,2
20 x 47	20	26	M6	8,8	160	16,9	74	31	0,2
22 x 47	20	26	M6	8,8	180	16,8	67	31	0,2
24 x 50	20	26	M6	8,8	220	18,8	69	33	0,2
25 x 50	20	26	M6	8,8	230	18,8	67	33	0,2
28 x 55	20	26	M6	8,8	290	20,7	66	34	0,3
30 x 55	20	26	M6	8,8	310	20,6	62	34	0,3
32 x 60	20	26	M6	8,8	390	24,7	69	37	0,3
35 x 60	20	26	M6	8,8	420	24,5	63	37	0,3
38 x 65	20	26	M6	8,8	540	28,5	68	40	0,3
40 x 65	20	26	M6	8,8	560	28,4	65	40	0,3
42 x 75	24	32	M8	21,4	940	44,9	83	47	0,6
45 x 75	24	32	M8	21,4	1.000	44,7	78	47	0,5
48 x 80	24	32	M8	21,4	1.000	44,6	73	44	0,6
50 x 80	24	32	M8	21,4	1.100	44,4	70	44	0,6
55 x 85	24	32	M8	21,4	1.400	51,6	74	48	0,6
60 x 90	24	32	M8	21,4	1.500	51,3	68	45	0,7
63 x 95	24	32	M8	21,4	1.800	58,4	74	49	0,7
65 x 95	24	32	M8	21,4	1.800	58,3	72	49	0,7
70 x 110	28	38	M10	44,0	2.900	84,3	81	51	1,2
75 x 115	28	38	M10	44,0	3.100	84,0	75	49	1,3
80 x 120	28	38	M10	44,0	3.300	83,6	71	47	1,4
85 x 125	28	38	M10	44,0	4.000	95,2	76	52	1,4
90 x 130	28	38	M10	44,0	4.200	94,9	72	50	1,5
95 x 135	28	38	M10	44,0	5.000	106,0	76	54	1,6
100 x 145	33	45	M12	74,0	5.800	117,0	74	51	2,1
110 x 155	33	45	M12	74,0	6.400	116,0	67	48	2,3
120 x 165	33	45	M12	74,0	7.900	132,0	70	51	2,5



Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 150 to 7.900 Nm
- Not self-centering, low self-locking
- Fixed axial hub position during tightening
- Two thrust rings with double taper design
- Low axial dimension
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h11; hub bore H11
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

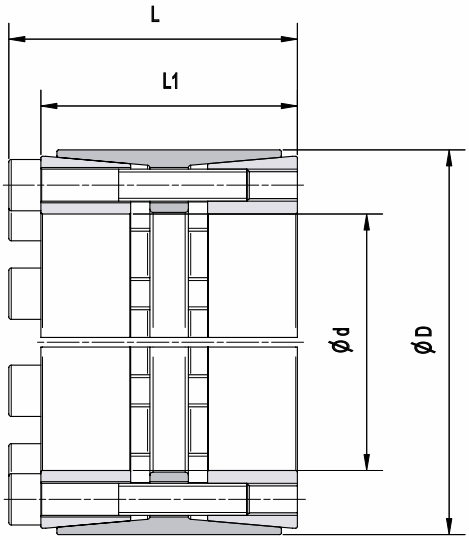
Composition

- Slotted inner ring
- Slotted outer ring
- Double taper front thrust ring, with integrated pull-out tapped holes
- Double taper rear thrust ring
- Set of socket head cap screws, grade A2-70

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 4061

Stainless steel



DIMENSIONS			SCREWS		PERFORMANCES				WEIGHT
d x D	L1	L	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
24 x 55	40	46	M6	11,8	420	35,4	78	34	0,4
25 x 55	40	46	M6	11,8	440	35,4	75	34	0,4
28 x 55	40	46	M6	11,8	490	35,4	67	34	0,4
30 x 55	40	46	M6	11,8	530	35,4	63	34	0,4
32 x 60	54	60	M6	11,8	660	41,3	48	26	0,6
35 x 60	54	60	M6	11,8	720	41,3	44	26	0,6
38 x 75	54	62	M8	28,7	1.450	76,7	76	38	1,0
40 x 75	54	62	M8	28,7	1.530	76,7	72	38	1,0
42 x 75	54	62	M8	28,7	1.610	76,7	68	38	1,0
45 x 75	54	62	M8	28,7	1.720	76,7	64	38	0,9
48 x 80	66	74	M8	28,7	2.100	87,7	53	32	1,3
50 x 80	66	74	M8	28,7	2.190	87,7	51	32	1,2
55 x 85	66	74	M8	28,7	2.710	98,7	52	34	1,3
60 x 90	66	74	M8	28,7	3.290	109,0	53	35	1,4
65 x 95	66	74	M8	28,7	3.560	109,0	49	33	1,5
70 x 110	80	90	M10	58,0	6.270	179,0	58	37	2,8
75 x 115	80	90	M10	58,0	6.710	179,0	54	35	3,0
80 x 120	80	90	M10	58,0	7.880	197,0	56	37	3,1
85 x 125	80	90	M10	58,0	8.370	197,0	53	36	3,3
90 x 130	80	90	M10	58,0	9.600	215,0	54	38	3,5
95 x 135	80	90	M10	58,0	10.200	215,0	51	36	3,6
100 x 145	102	114	M12	100,0	14.400	289,0	53	36	5,6
110 x 155	102	114	M12	100,0	17.300	316,0	52	37	6,1
120 x 165	102	114	M12	100,0	22.100	368,0	56	41	6,5

Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 420 to 22.100 Nm
- Self-centering, self-locking
- Two thrust rings with single taper design
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h8; hub bore H8
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

Composition

- Slotted front thrust ring, with integrated push-off tapped and clearance holes
- Slotted rear thrust ring
- Slotted outer ring, with integrated push-off tapped holes
- Set of socket head cap screws, grade A4-80

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 5061

Stainless steel

DIMENSIONS					SCREWS		PERFORMANCES				WEIGHT
d x D	L2	L1	L	D1	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
6 x 14	10	22,0	26,0	25	M4	2,6	8	2,8	61	26	0,04
7 x 15	12	25,0	29,0	27	M4	2,6	10	2,8	44	20	0,04
8 x 15	12	25,0	29,0	27	M4	2,6	11	2,8	38	20	0,05
9 x 16	14	27,0	31,0	29	M4	2,6	17	3,8	39	22	0,06
10 x 16	14	27,0	31,0	29	M4	2,6	19	3,8	35	22	0,06
11 x 18	14	27,5	31,5	32	M4	2,6	21	3,8	32	20	0,07
12 x 18	14	27,5	31,5	32	M4	2,6	23	3,8	29	20	0,07
13 x 23	14	27,5	31,5	38	M4	2,6	25	3,8	27	15	0,11
14 x 23	14	27,5	31,5	38	M4	2,6	27	3,8	25	15	0,11
15 x 24	16	36,5	42,5	44	M6	11,8	66	8,8	47	29	0,2
16 x 24	16	36,5	42,5	44	M6	11,8	70	8,8	44	29	0,2
17 x 25	18	39,5	45,5	45	M6	11,8	100	11,8	49	33	0,2
18 x 26	18	39,5	45,5	47	M6	11,8	106	11,8	46	32	0,3
19 x 27	18	39,5	45,5	49	M6	11,8	112	11,8	44	31	0,3
20 x 28	18	39,5	45,5	50	M6	11,8	118	11,8	42	30	0,3
22 x 32	25	47,0	53,0	54	M6	11,8	129	11,8	27	19	0,4
24 x 34	25	47,0	53,0	56	M6	11,8	212	17,7	38	27	0,4
25 x 34	25	47,0	53,0	56	M6	11,8	221	17,7	36	27	0,4
28 x 39	25	47,0	53,0	61	M6	11,8	247	17,7	32	23	0,4
30 x 41	25	47,0	53,0	62	M6	11,8	265	17,7	30	22	0,4
32 x 43	25	47,0	53,0	65	M6	11,8	377	23,6	38	28	0,5
35 x 47	32	54,0	60,0	68	M6	11,8	413	23,6	27	20	0,5
38 x 50	32	54,0	60,0	72	M6	11,8	448	23,6	25	19	0,6
40 x 53	32	54,0	60,0	75	M6	11,8	472	23,6	23	18	0,7
42 x 55	32	54,0	60,0	78	M6	11,8	495	23,6	22	17	0,7
45 x 59	45	70,0	78,0	86	M8	28,7	980	43,8	28	21	1,1
48 x 62	45	70,0	78,0	87	M8	28,7	1.050	43,8	26	20	1,1
50 x 65	45	70,0	78,0	92	M8	28,7	1.090	43,8	25	19	1,3
55 x 71	55	81,0	89,0	98	M8	28,7	1.350	49,3	21	16	1,6
60 x 77	55	81,0	89,0	104	M8	28,7	1.480	49,3	19	15	1,8
65 x 84	55	81,0	89,0	111	M8	28,7	1.600	49,3	18	14	2,1
70 x 90	65	96,0	106,0	119	M10	58,0	2.820	80,6	23	18	2,8
75 x 95	65	96,0	106,0	126	M10	58,0	3.020	80,6	21	17	3,1
80 x 100	65	96,0	106,0	131	M10	58,0	4.300	107	26	21	3,2
85 x 106	65	96,0	106,0	137	M10	58,0	4.560	107	25	20	3,5
90 x 112	65	96,0	106,0	144	M10	58,0	4.830	107	23	19	3,9
95 x 120	65	96,0	106,0	149	M10	58,0	5.950	125	26	20	4,3
100 x 125	70	107,0	119,0	160	M12	100,0	7.900	158	29	23	5,5
110 x 140	70	107,0	119,0	174	M12	100,0	8.690	158	26	21	6,8
120 x 155	90	128,0	140,0	198	M12	100,0	12.600	210	25	19	9,9

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

Features

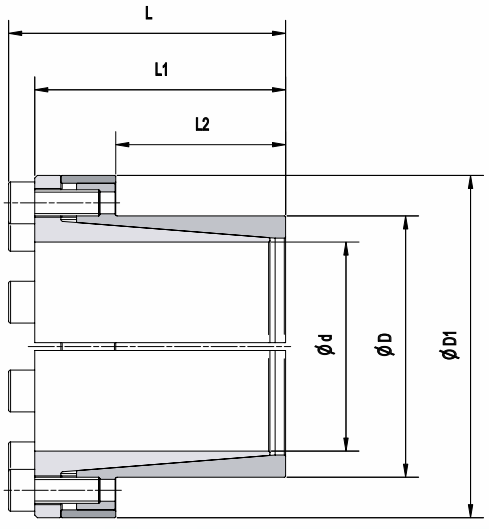
- Transmissible torque from 8 to 12.600 Nm
- Self-centering, self-locking
- Fixed axial hub position during tightening
- Single taper design
- Well suited for connection of thin walled hubs
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h11; hub bore H11
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

Composition

- Slotted inner ring, with integrated push-off tapped holes
- Slotted outer ring
- Spacer ring
- Set of socket head cap screws, grade A4-80 (size ‹ M6, grade A2-70)

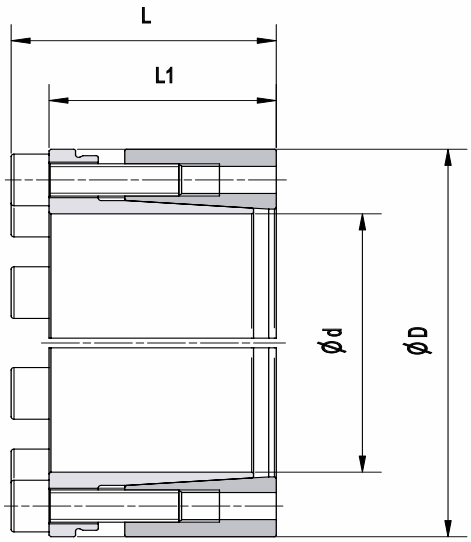
Code

- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore



MAV 6901

Stainless steel



DIMENSIONS			SCREWS		PERFORMANCES				WEIGHT
d x D	L1	L	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
18 x 47	42,0	48,0	M6	11,8	290	32,2	88	34	0,4
19 x 47	42,0	48,0	M6	11,8	306	32,2	83	34	0,4
20 x 47	42,0	48,0	M6	11,8	322	32,2	79	34	0,4
22 x 47	42,0	48,0	M6	11,8	355	32,2	72	34	0,3
24 x 50	43,0	49,0	M6	11,8	387	32,2	66	32	0,4
25 x 50	43,0	49,0	M6	11,8	403	32,2	63	32	0,4
28 x 55	43,0	49,0	M6	11,8	451	32,2	56	29	0,5
30 x 55	43,0	49,0	M6	11,8	484	32,2	53	29	0,5
32 x 60	43,0	49,0	M6	11,8	688	43,0	66	35	0,5
35 x 60	43,0	49,0	M6	11,8	752	43,0	60	35	0,5
38 x 65	43,0	49,0	M6	11,8	817	43,0	55	32	0,6
40 x 65	43,0	49,0	M6	11,8	860	43,0	53	32	0,5
42 x 75	50,5	58,5	M8	28,7	1.258	59,9	61	34	1,0
45 x 75	50,5	58,5	M8	28,7	1.347	59,9	56	34	0,9
48 x 80	50,5	58,5	M8	28,7	1.437	59,9	53	32	1,0
50 x 80	50,5	58,5	M8	28,7	1.497	59,9	51	32	1,0
55 x 85	50,5	58,5	M8	28,7	2.196	79,8	62	40	1,0
60 x 90	50,5	58,5	M8	28,7	2.395	79,8	56	38	1,1
63 x 95	50,5	58,5	M8	28,7	2.515	79,8	54	36	1,2
65 x 95	50,5	58,5	M8	28,7	2.595	79,8	52	36	1,2
70 x 110	60,0	70,0	M10	58,0	3.988	113,9	52	33	2,2
75 x 115	60,0	70,0	M10	58,0	4.273	113,9	48	32	2,4
80 x 120	60,0	70,0	M10	58,0	4.557	113,9	45	30	2,5
85 x 125	60,0	70,0	M10	58,0	5.534	130,2	49	33	2,7
90 x 130	60,0	70,0	M10	58,0	5.860	130,2	46	32	2,8
95 x 135	60,0	70,0	M10	58,0	7.731	162,8	55	38	2,9
100 x 145	71,0	83,0	M12	100,0	8.357	167,1	46	32	4,2
110 x 155	71,0	83,0	M12	100,0	9.193	167,1	42	30	4,1
120 x 165	71,0	83,0	M12	100,0	11.461	191,0	44	32	4,9
130 x 180	71,0	83,0	M12	100,0	15.520	238,8	51	37	5,9

Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 290 to 15.520 Nm
- Self-centering, self-locking
- Single taper design
- Fitting length larger than MAV 1062
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h8; hub bore H8
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

Composition

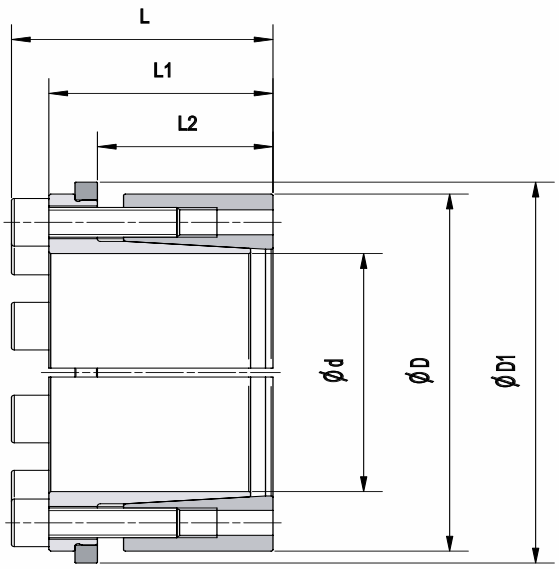
- Slotted inner ring, with integrated push-off tapped holes
- Slotted outer ring
- Set of socket head cap screws, grade A4-80

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 6902

Stainless steel

DIMENSIONS					SCREWS		PERFORMANCES				WEIGHT
d x D	L2	L1	L	D1	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
18 x 47	30,0	42,0	48,0	53,0	M6	11,8	164	18,2	50	19	0,4
19 x 47	30,0	42,0	48,0	53,0	M6	11,8	173	18,2	47	19	0,4
20 x 47	30,0	42,0	48,0	53,0	M6	11,8	182	18,2	45	19	0,4
22 x 47	30,0	42,0	48,0	53,0	M6	11,8	201	18,2	41	19	0,4
24 x 50	31,0	43,0	49,0	56,0	M6	11,8	219	18,2	37	18	0,4
25 x 50	31,0	43,0	49,0	56,0	M6	11,8	228	18,2	36	18	0,4
28 x 55	31,0	43,0	49,0	61,0	M6	11,8	255	18,2	32	16	0,5
30 x 55	31,0	43,0	49,0	61,0	M6	11,8	274	18,2	30	16	0,5
32 x 60	31,0	43,0	49,0	66,0	M6	11,8	389	24,3	37	20	0,5
35 x 60	31,0	43,0	49,0	66,0	M6	11,8	426	24,3	34	20	0,5
38 x 65	31,0	43,0	49,0	71,0	M6	11,8	462	24,3	31	18	0,6
40 x 65	31,0	43,0	49,0	71,0	M6	11,8	486	24,3	30	18	0,6
42 x 75	35,5	50,5	58,5	81,0	M8	28,7	711	33,9	34	19	1,0
45 x 75	35,5	50,5	58,5	81,0	M8	28,7	762	33,9	32	19	0,9
48 x 80	35,5	50,5	58,5	86,0	M8	28,7	813	33,9	30	18	1,0
50 x 80	35,5	50,5	58,5	86,0	M8	28,7	847	33,9	29	18	1,0
55 x 85	35,5	50,5	58,5	91,0	M8	28,7	1.242	45,2	35	23	1,1
60 x 90	35,5	50,5	58,5	96,0	M8	28,7	1.355	45,2	32	21	1,1
63 x 95	35,5	50,5	58,5	101,0	M8	28,7	1.423	45,2	30	20	1,3
65 x 95	35,5	50,5	58,5	101,0	M8	28,7	1.468	45,2	29	20	1,2
70 x 110	47,0	60,0	70,0	117,0	M10	58,0	2.256	64,5	29	19	2,3
75 x 115	47,0	60,0	70,0	122,0	M10	58,0	2.417	64,5	27	18	2,5
80 x 120	47,0	60,0	70,0	127,0	M10	58,0	2.578	64,5	26	17	2,6
85 x 125	47,0	60,0	70,0	132,0	M10	58,0	3.131	73,7	28	19	2,7
90 x 130	47,0	60,0	70,0	137,0	M10	58,0	3.315	73,7	26	18	2,9
95 x 135	47,0	60,0	70,0	142,0	M10	58,0	4.374	92,1	31	22	3,0
100 x 145	53,0	71,0	83,0	153,0	M12	100,0	4.728	94,6	26	18	4,4
110 x 155	53,0	71,0	83,0	163,0	M12	100,0	5.200	94,6	24	17	4,7
120 x 165	53,0	71,0	83,0	173,0	M12	100,0	6.483	108,1	25	18	5,0
130 x 180	53,0	71,0	83,0	188,0	M12	100,0	8.780	135,1	29	21	6,0



Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 164 to 8.780 Nm
- Self-centering, self-locking
- Fixed axial hub position during tightening
- Single taper design
- Fitting length larger than MAV 1061
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h8; hub bore H8
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

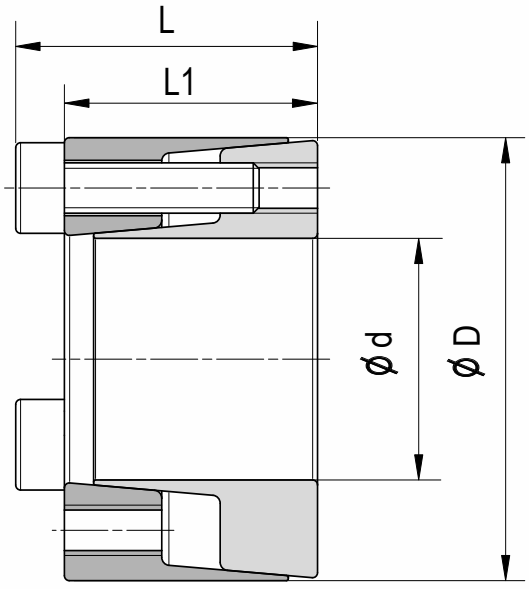
Composition

- Slotted inner ring, with integrated push-off tapped holes
- Slotted outer ring
- Spacer ring
- Set of socket head cap screws, grade A4-80

Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 7903

Stainless steel



DIMENSIONS			SCREWS		PERFORMANCES				WEIGHT
d x D	L1	L	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
5 x 16	11	13,5	M2,5	0,6	3	1,3	43	13	0,012
6 x 16	11	13,5	M2,5	0,6	4	1,3	36	13	0,012
6,35 x 16	11	13,5	M2,5	0,6	4	1,3	34	13	0,012
7 x 17	11	13,5	M2,5	0,6	4	1,3	31	13	0,013
8 x 18	11	13,5	M2,5	0,6	5	1,3	27	12	0,015
9 x 20	13	15,5	M2,5	0,6	8	1,7	28	13	0,020
9,53 x 20	13	15,5	M2,5	0,6	8	1,7	27	13	0,020
10 x 20	13	15,5	M2,5	0,6	8	1,7	25	13	0,019
11 x 22	13	15,5	M2,5	0,6	9	1,7	23	12	0,023
12 x 22	13	15,5	M2,5	0,6	10	1,7	21	12	0,022
14 x 26	17	20,0	M3	1,1	20	2,9	22	12	0,039
15 x 28	17	20,0	M3	1,1	21	2,9	21	11	0,044
16 x 32	17	21,0	M4	2,6	41	5,1	34	17	0,066
17 x 35	21	25,0	M4	2,6	43	5,1	28	13	0,092
18 x 35	21	25,0	M4	2,6	46	5,1	26	13	0,087
19 x 35	21	25,0	M4	2,6	48	5,1	25	13	0,084
20 x 38	21	26,0	M5	5,1	80	8,0	37	19	0,10
22 x 40	21	26,0	M5	5,1	88	8,0	33	18	0,11
24 x 47	26	32,0	M6	8,8	140	11,8	35	18	0,20
25 x 47	26	32,0	M6	8,8	140	11,8	34	18	0,19
25,4 x 47	26	32,0	M6	8,8	150	11,8	33	18	0,19
28 x 50	26	32,0	M6	8,8	240	17,8	45	25	0,22
30 x 55	26	32,0	M6	8,8	260	17,8	42	23	0,27
32 x 55	26	32,0	M6	8,8	280	17,8	39	23	0,25
35 x 60	31	37,0	M6	8,8	410	23,7	39	23	0,36
38 x 65	31	37,0	M6	8,8	450	23,7	36	21	0,43
40 x 65	31	37,0	M6	8,8	470	23,7	34	21	0,40
42 x 75	36	44,0	M8	21,4	690	32,9	38	22	0,69
45 x 75	36	44,0	M8	21,4	740	32,9	36	22	0,63
48 x 80	36	44,0	M8	21,4	1.050	43,9	45	27	0,74
50 x 80	36	44,0	M8	21,4	1.090	43,9	43	27	0,70

Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on shaft
- Ph: contact pressure in hub bore

Features

- Transmissible torque from 3 to 1.090 Nm
- Self-centering, low self-locking
- Listed performances are valid as long as hub is free to move axially during tightening. Otherwise, reduced performances apply.
- Single taper design
- Lubrication: food grade oil FDA approved class H-1
- Tolerances: shaft h8; hub bore H8
- Shaft and hub bore surface finish 0.8 ≤ Ra ≤ 3.2 µm

Composition

- Slotted inner ring
- Slotted outer ring, with integrated push-off tapped holes
- Set of socket head cap screws, grade A2-70

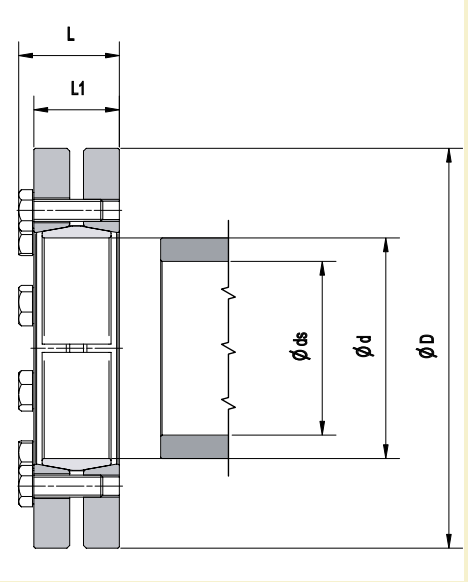
Listed performances are valid as long as shaft and hub are made of stainless steel. Should these parts be made of different materials, listed values might not apply. Please consult MAV Technical Dept. for advise.

MAV 2008

Stainless steel series AISI 400

Features

- Connection of outer hollow shaft onto inner shaft
- Transmissible torque from 310 to 34.400 Nm
  For HALF HC and HT versions, Mt and Fax are reduced to 50% of listed values.
- Not self-locking tapers
- Three-part design
- Lubrication: food grade paste FDA approved class H-1
- Outer hollow shaft – inner shaft contact surface lubricant-free and dry
- Tolerance of outer hollow shaft outer diameter: h8 or f7
- Outer hollow shaft – inner shaft clearance:
  - max values according to table
  - min value 0.017 mm, to prevent installation issues
- Outer hollow shaft – inner shaft surface finish 0.8 ≤ Ra ≤ 3.2 µm



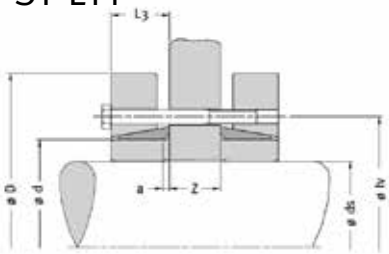
Composition

- Slotted inner ring
- Front outer ring
- Rear outer ring
- Set of hexagonal head cap screws, grade A2-70

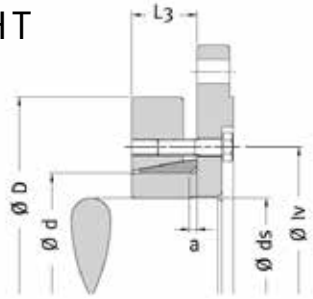
web clearance holes dia. (mm)						
screw size	M5	M6	M8	M10	M12	M16
shrink disc split	7.0	8.0	10.0	13.0	15.0	19.0
shrink disc half HT	5.5	7.0	9.0	11.0	13.5	18.0

DIMENSIONS							SCREWS			PERFORMANCES				WEIGHT
ds	d x D	L	L1	L3	IntV	a x 45°	n.	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm	mm	mm	mm			Nm	Nm	kN	MPa	MPa	kg
19										310	32	111	199	
20	24 x 50	21,5	18	11,5	36	2,1	6	M5	3,9	400	40	130	199	0,19
21										500	48	149	199	
24										480	40	95	162	
25	30 x 60	23,5	20	12,5	44	2,1	7	M5	3,9	590	47	108	162	0,29
26										710	55	119	162	
28										450	32	58	121	
30	36 x 72	26,0	22	13,5	52	2,1	5	M6	6,8	670	45	76	121	0,47
31										630	40	66	121	
34										590	35	46	125	
35	44 x 80	28,0	24	14,5	61	2,1	7	M6	6,8	750	43	55	125	0,59
36										910	51	64	125	
38										710	37	41	114	
40	50 x 90	31,0	27	16,0	70	2,1	8	M6	6,8	1.060	53	55	114	0,81
42										1.440	69	68	114	
42										750	36	34	99	
45	55 x 100	33,0	29	17,0	75	2,9	8	M6	6,8	1.300	58	51	99	1,1
48										1.930	81	66	99	
48										1.600	67	55	110	
50	62 x 110	33,0	29	17,0	86	2,9	10	M6	6,8	2.020	81	64	110	1,3
52										2.020	78	59	110	
50										1.250	50	39	100	
55	68 x 115	33,0	29	17,0	86	2,9	10	M6	6,8	1.690	62	44	100	1,3
60										3.070	102	67	100	

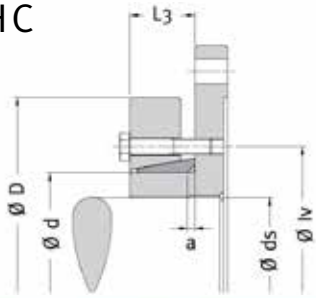
SPLIT



HT



HC



Stainless steel series AISI 400

shaft - hollow shaft fitting tolerances			
shaft size ds (mm)		ISO tolerances	max clearance
from	to		mm
11	18	n/a	0,017
19	30	H6 - j6	
31	50	H6 - h6	0,032
51	80	H6 - g6	0,048
81	120	H7 - g6	0,069
121	180		0,079

Code
- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=o kN
- Fax: transmissible axial load, with Mt=o Nm
- Ps: contact pressure on inner shaft
- Ph: contact pressure on outer hollow shaft

Listed performances are valid as long as outer hollow shaft and inner shaft are made of stainless steel. Should these parts be made of different materials, listed values might not apply.
As long as inner shaft is made of standard steel and outer hollow shaft is made of stainless steel, Mt and Fax will be derated to 57.14% of listed values.
Please consult MAV Technical Dept. for advise.
Information subject to change without prior notification, © MAV S.p.A.

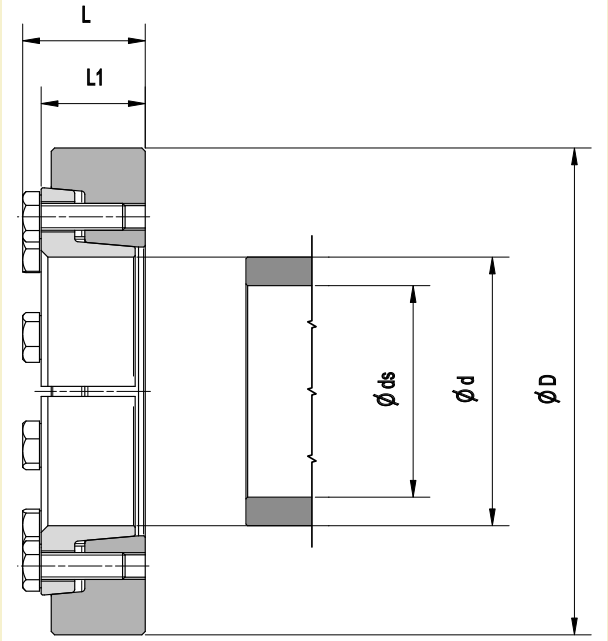
DIMENSIONS							SCREWS			PERFORMANCES				WEIGHT
ds	d x D	L	L1	L3	IntV	a x 45°	n.	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm	mm	mm	mm			Nm	Nm	kN	MPa	MPa	kg
55										1.310	48	32	107	
60	75 x 138	36,3	31	20,5	100	3,7	7	M8	16	2.630	88	53	107	2,2
65										4.210	129	72	107	
60										1.730	58	35	100	
65	80 x 145	36,3	31	20,5	100	4,0	7	M8	16	3.090	95	53	100	2,4
70										4.720	135	70	100	
60										2.220	74	37	112	
65	85 x 155	43,3	38	24,0	114	4,0	10	M8	16	3.830	118	55	112	3,4
70										5.740	164	71	112	
65										2.790	86	40	106	
70	90 x 155	43,3	38	24,0	114	4,0	10	M8	16	4.480	128	55	106	3,3
75										6.440	172	69	106	
65										2.610	80	33	106	
70	95 x 170	48,3	43	26,5	124	4,0	12	M8	16	4.380	125	48	106	4,6
75										6.440	172	61	106	
70										3.280	94	36	101	
75	100 x 170	48,3	43	26,5	124	4,0	12	M8	16	5.120	137	49	101	4,4
80										7.250	181	61	101	
70										2.980	85	28	99	
75	105 x 185	55,4	49	29,5	136	4,0	9	M10	32	4.930	132	41	99	6,2
80										7.190	180	52	99	
75										3.740	100	31	95	
80	110 x 185	55,4	49	29,5	136	4,0	9	M10	32	5.780	145	42	95	5,9
85										5.900	139	38	95	
80										5.700	143	41	98	
85	115 x 200	56,4	50	30,0	150	4,0	10	M10	32	5.460	128	34	98	7,2
90										8.320	185	47	98	
85										3.810	90	24	94	
90	120 x 200	56,4	50	30,0	150	4,0	10	M10	32	6.410	142	36	94	7,0
95										9.350	197	47	94	
85										4.610	108	28	103	
90	125 x 215	59,4	53	31,5	160	4,0	12	M10	32	7.340	163	39	103	8,7
95										10.400	220	50	103	
90										5.630	125	30	99	
95	130 x 215	59,4	53	31,5	160	4,0	12	M10	32	8.460	178	41	99	8,4
100										11.600	233	50	99	
95										8.010	169	35	103	
100	140 x 230	65,5	58	34,0	175	6,0	10	M12	55	11.200	225	44	103	10
105										14.800	282	53	103	
105										12.400	237	41	103	
110	155 x 263	69,5	62	36,0	192	6,0	12	M12	55	16.200	295	49	103	15
115										20.300	354	56	103	
115										22.100	384	54	108	
120	165 x 290	78,0	68	39,0	210	5,0	8	M16	135	26.900	449	61	108	21
125										29.800	477	62	108	
125										23.600	377	49	101	
130	175 x 300	78,0	68	39,0	220	6,0	8	M16	135	28.800	443	55	101	21
135										34.400	510	61	101	

MAV 3008

Stainless steel series AISI 400

Features

- Connection of outer hollow shaft onto inner shaft
- Transmissible torque from 87 to 26.403 Nm
- Low self-locking tapers
- Two-part design
- Lubrication: food grade paste FDA approved class H-1
- Outer hollow shaft bore – inner shaft contact surface lubricant-free and dry
- Tolerance of outer hollow shaft outer diameter: h8 or f7
- Outer hollow shaft – inner shaft clearance:
  - max values according to table
  - min value 0.017 mm, to prevent installation issues
- Outer hollow shaft – inner shaft surface finish 0.8 ≤ Ra ≤ 3.2 µm



Composition

- Slotted inner ring, with integrated push-off tapped holes
- Outer ring
- Set of hexagonal head cap screws, grade A2-70

DIMENSIONS				SCREWS		PERFORMANCES				WEIGHT
ds	d x D	L	L1	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
15	18 x 44	19,0	15	M6	6,8	87	11,6	59	150	0,14
16						154	19,3	91	150	
17	20 x 47	19,0	15	M6	6,8	118	13,9	62	135	0,15
18						188	20,8	88	135	
19						113	11,9	41	128	
20	24 x 50	22,0	18	M6	6,8	185	18,5	60	128	0,20
21						267	25,4	79	128	
24						230	19,2	45	112	
25	30 x 60	24,0	20	M6	6,8	318	25,4	58	112	0,31
26						414	31,9	70	112	
28						451	32,2	58	121	
30	36 x 72	27,3	22	M8	16	674	44,9	76	121	0,49
31						627	40,5	66	121	
34						420	24,7	33	112	
35	44 x 80	29,3	24	M8	16	566	32,4	42	112	0,62
36						723	40,2	51	112	
38						896	47,2	51	125	
40	50 x 90	31,3	26	M8	16	1.264	63,2	65	125	0,83
42						1.675	79,8	79	125	
42						1.303	62,1	58	124	
45	55 x 100	34,3	29	M8	16	1.934	85,9	76	124	1,2
48						2.660	110,8	91	124	
48						1.599	66,6	55	110	
50	62 x 110	34,3	29	M8	16	2.018	80,7	64	110	1,4
52						2.026	77,9	59	110	

Code

- Ma: screws tightening torque
- Mt: transmissible torque, with Fax=0 kN
- Fax: transmissible axial load, with Mt=0 Nm
- Ps: contact pressure on inner shaft
- Ph: contact pressure on outer hollow shaft

Listed performances are valid as long as outer hollow shaft and inner shaft are made of stainless steel. Should these parts be made of different materials, listed values might not apply.
As long as inner shaft is made of standard steel and outer hollow shaft is made of stainless steel, Mt and Fax will be derated to 57.14% of listed values.
Please consult MAV Technical Dept. for advise.
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Stainless steel series AISI 400

shaft - hollow shaft fitting tolerances			
shaft size ds (mm)		ISO tolerances	max clearance
from	to		mm
11	18	n/a	0,017
19	30	H6 - j6	
31	50	H6 - h6	0,032
51	80	H6 - g6	0,048
81	120	H7 - g6	0,069
121	180		0,079

DIMENSIONS				SCREWS		PERFORMANCES				WEIGHT
ds	d x D	L	L1	size	Ma	Mt	Fax	Ps	Ph	
mm	mm	mm	mm		Nm	Nm	kN	MPa	MPa	kg
50						1.648	65,9	52	113	
55	68 x 115	34,3	29	M8	16	2.176	79,1	57	113	1,4
60						3.645	121,5	80	113	
55						322	11,7	8	83	
60	75 x 138	37,4	31	M10	32	1.444	48,1	29	83	2,3
65						2.821	86,8	49	83	
60						618	20,6	12	78	
65	80 x 145	37,4	31	M10	32	1.795	55,2	31	78	2,5
70						3.212	91,8	48	78	
65						1.028	31,6	15	80	
70	90 x 155	44,4	38	M10	32	2.431	69,4	30	80	3,4
75						4.090	109,1	44	80	
70						1.567	44,8	17	82	
75	100 x 170	49,4	43	M10	32	3.162	84,3	30	82	4,7
80						5.021	125,5	42	82	
75						2.568	68,5	21	85	
80	110 x 185	56,5	49	M12	55	4.449	111,2	32	85	6,2
85						4.394	103,4	28	85	
80						4.040	101,0	27	85	
85	115 x 197	60,5	53	M12	55	3.531	83,1	21	85	7,6
90						6.263	139,2	33	85	
85						1.895	44,6	11	81	
90	120 x 197	60,5	53	M12	55	4.361	96,9	23	81	7,3
95						7.179	151,1	34	81	
85						1.878	44,2	11	87	
90	125 x 215	60,5	53	M12	55	4.281	95,1	23	87	9,2
95						7.022	147,8	34	87	
85						503	11,8	3	83	
90	130 x 215	60,5	53	M12	55	2.685	59,7	14	83	8,8
95						5.184	109,1	25	83	
90						1.392	30,9	7	81	
95	135 x 230	66,8	58	M14	89	3.894	82,0	17	81	11
100						6.733	134,7	27	81	
95						2.240	47,2	10	78	
100	140 x 230	66,8	58	M14	89	4.843	96,9	19	78	11
105						7.775	148,1	28	78	
105						5.790	110,3	19	81	
110	155 x 263	70,8	62	M14	89	8.901	161,8	27	81	16
115						12.349	214,8	34	81	
115						12.140	211,1	30	83	
120	165 x 290	78,0	68	M16	135	16.110	268,5	36	83	22
125						18.094	289,5	38	83	
125						16.719	267,5	35	87	
130	175 x 300	78,0	68	M16	135	21.363	328,7	41	87	23
135						26.403	391,2	47	87	

LOCKING ASSEMBLIES

Installation

MAV Locking Assemblies are supplied ready for installation. Rated performances apply as long as rings, screws, shaft and hub bore are slightly lubricated with food grade oil Dow Corning Molykote® L-0532FG. DO NOT USE low friction lubricants.

1. Make sure that Locking Assembly, shaft and hub bore are clean and slightly oiled.
2. Loosen all screws and transfer at least two of them into integrated push-off threads. Tighten them slightly to lock out mating tapers and prevent engagement during installation (see fig. 1).
3. Insert Locking Assembly into hub bore and onto shaft, then relocate screws used to separate rings.
4. Make sure of correct position of shaft and hub, then evenly tighten all screws by hand.
5. Use a calibrated torque wrench and set it approximately 5% higher than tightening torque specified in this catalogue. Starting with a screw approximately located at 90° from slit, progressively tighten the screws in a crosswise pattern, using 1/4 turns each step. The two screws adjacent to the slit shall be tightened one after the other.
6. Still apply overtorque for a few more steps, to compensate for any possible relaxation.
7. Reset torque wrench to tightening torque specified in this catalogue and make sure that none of the screws can turn, otherwise repeat step 6.

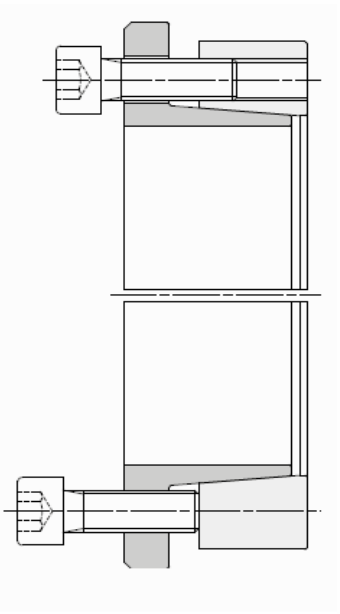

Fig. 1

Removal

Prior to initiating the removal procedure, make sure that no loads are acting on Locking Assembly, shaft or any connected component.

IMPORTANT! The final user must ensure that ends of locking screws used for removal are ground flat and slightly chamfered to prevent damage to screws during push-off. Screws with ground flat and chamfered end are not supplied by MAV. The final user has to take charge of machining of end of screws.

1. Make sure that axial movement of locking rings – necessary for removal – is not restricted. Likewise, make sure that push-off threads are in good conditions.
2. Progressively loosen all locking screws and transfer the corresponding number into all push-off threads.
3. Release locking rings by progressively tightening all push-off screws in a crosswise pattern, not exceeding 1/4 turns for several passes (see fig. 2).

NOTE: download from our website www.mav.it, or request to our Technical Dept., the detailed installation and removal instructions for each MAV Locking Assemblies series.

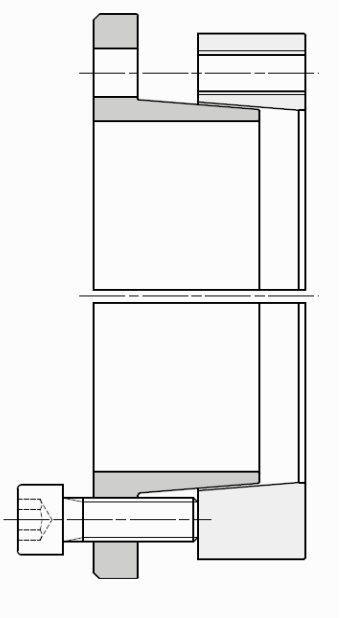

Fig. 2

SHRINK DISCS

Installation

MAV Shrink Discs are supplied ready for installation. Remove spacers that may have been used to keep the rings disengaged.
Rated performances are based on the following conditions:

- conical surfaces and screws lubricated with food grade paste Dow Corning Molykote® P-1900
- outer hollow shaft – inner shaft maximum clearance according to catalogue
- outer hollow shaft – inner shaft contact surface lubricant-free and dry

IMPORTANT! Never tighten locking screws prior to installation.

1. Make sure that outer diameter of outer hollow shaft and bore of Shrink Disc are clean and oiled.
2. Mount Shrink Disc onto outer hollow shaft.
3. Carefully solvent clean and dry inner shaft and bore of outer hollow shaft for a lubricant-free and dry contact.
4. Insert inner shaft into outer hollow shaft, making sure of proper position of Shrink Disc and connected components.
5. Evenly tighten a few equally spaced screws by hand; then hand-tighten remaining screws.
6. Use a calibrated torque wrench and set it approximately 5% higher than tightening torque specified in this catalogue. Progressively tighten the screws in a circular pattern, using 1/4 turns each step.
7. Still apply overtorque for a few more steps, to compensate for any possible relaxation.
8. Reset torque wrench to tightening torque specified in this catalogue and make sure that none of the screws can turn, otherwise repeat step 7.

Removal

Prior to initiating the removal procedure, make sure that no loads are acting on Shrink Disc, shaft or any connected component.

WARNING: DO NOT COMPLETELY REMOVE screws before rings are disengaged. Sudden separation of rings could involve high separation forces that may result in permanent injury or death.

IMPORTANT! For series MAV 3008 only, the final user must ensure that ends of locking screws used for removal are ground flat and slightly chamfered to prevent damage to screws during push-off. Screws with ground flat and chamfered end are not supplied by MAV. The final user has to take charge of machining of end of screws.

1. Make sure that axial movement of locking rings – necessary for removal – is not restricted. For series MAV 3008 only, make also sure that push-off threads are in good conditions.
2. Release locking rings by progressively loosening all screws in a circular pattern, not exceeding 1/4 turns for several passes.
3. For series MAV 3008 only: shouldn't locking rings be released after loosening of screws, transfer the corresponding number into all push-off threads located in the front face of inner ring. Release locking rings by progressively tightening these screws in a crosswise pattern, not exceeding 1/4 turns for several passes.

NOTE: download from our website www.mav.it, or request to our Technical Dept., the detailed installation and removal instructions for each MAV Shrink Discs series.

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